

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

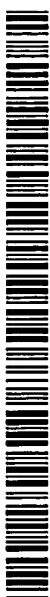


(43) International Publication Date
27 March 2003 (27.03.2003)

PCT

(10) International Publication Number
WO 03/025139 A3

- (51) International Patent Classification⁷: **A61K 51/00**, 31/00, 38/00, 31/70, C07H 21/04
- (74) Agent: **KNOWLES, Sherry, M.**; King & Spalding, 191 Peachtree St., Atlanta, GA 30303-1763 (US).
- (21) International Application Number: **PCT/US02/29571**
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date:
17 September 2002 (17.09.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/322,821 17 September 2001 (17.09.2001) US
60/410,627 13 September 2002 (13.09.2002) US
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (*for all designated States except US*): **MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH** [US/US]; 200 First Street S.w., Rochester, MN 55905 (US).
- Published:
— *with international search report*
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **COLLINS, Douglas, A.** [US/US]; 1150 Meadowlark Court SW, Rochester, MN 55902 (US). **CALLSTROM, Matthew** [US/US]; 50. 17th St. NW, Rochester, MN 55901-2502 (US). **PRENDERGAST, Franklyn, G.** [US/US]; 20 First ST. S.W., Rochester, MN 55905 (US).
- (88) Date of publication of the international search report:
21 August 2003
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*



WO 03/025139 A3

(54) Title: **COBALAMIN MEDIATED DELIVERY OF NUCLEIC ACIDS, ANALOGS AND DERIVATIVES THEREOF**

(57) Abstract: This invention is in the area of cobalamin-mediated delivery of nucleic acids and analogs.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/29571

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61K 51/00, 31/00, 38/00, 31/70; C07H 21/04

US CL : 424/1.73; 514/1, 2, 44; 536/23.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 424/1.73; 514/1, 2, 44; 536/23.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

STN: medline caplus embase biosis biotechds scisearch

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99/65529 A1 (ALZA CORPORATION) 23 December 1999 (23.12.1999), See	1, 11, 12, 18, 28-30
---	entire document, especially abstract, page 4, lines 19-29; page 5 lines 6-21; page 6, lines	-----
Y	4 to page 7, line 10; page 7, line-18-page 11, line 8.	2-10, 13, 14, 19-27
X	Database Scisearch on STN (The Genuine Article), AN 1998: 196974, No. ZA014,	1, 3, 11
---	'Evaluation of coupling of cobalamin to antisense oligonucleotides by thin-layer and	-----
Y	reversed-phase liquid chromatography', abstract, GUY et al, 27 February, 1998.	2, 4-10, 12-14, 18-30

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.*** Special categories of cited documents:**

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

11 December 2002 (11.12.2002)

Date of mailing of the international search report

21 APR 2003

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

Richard Schumizer, Ph.D.
Valerie Bell-Harris

Telephone No. (703) 308-0196

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/29571

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claim Nos.: 16 and 17
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Please See Continuation Sheet
3. ☒ Claim Nos.: 15
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

- The additional search fees were accompanied by the applicant's protest.
No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US02/29571

Continuation of Box I Reason 2:

Claim 16 is so indefinite that no meaningful search could be carried out. the claim is incomplete, ending in the clause "wherein the nucleic acid". No information is given regarding the nucleic acid. Claim 17 is similarly indefinite because it depends from claim 16.